

REMARKS

Claims 1-4 remain pending in the application. Claims 1, 3 and 4 have been amended. The amendments to the claims contained herein are of equivalent scope as originally filed and, thus, are not a narrowing amendment. The Examiner is respectfully requested to reconsider and withdraw the rejection(s) in view of the amendments and remarks contained herein.

REJECTION UNDER 35 U.S.C. § 112

Claims 3 and 4 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point and distinctly claim the subject matter which Applicant regards as the invention. The claims have been amended to overcome the rejection. Reconsideration of the rejection is respectfully requested.

REJECTION UNDER 35 U.S.C. § 102

Claim 1 stands rejected under 35 U.S.C. § 102(b) as being anticipated by Abolins (U.S. Pat. No. 4,692,490). Abolins does not teach the use of the organic clay which is obtained by rendering a specific clay mineral as defined in amended Claim 1 organic with an organic agent. In this regard, it should be noted that the organic clay is materially different from clay since the organic clay is rendered organic and has a specific configuration as described in the specification, page 5, line 13 through page 6, line 5, while the clay is an inorganic material. Abolins merely teaches the use of clay in a thin molded article, having L/t of 83, of PPO and HIPS, but does not teach the use of the organic clay in a thin molded article, having $L/t \geq 70$, of PPO and HIPS.

Thus, Applicant believes Claim 1, as amended patentably distinguishes over the art of record. Reconsideration of the rejection is respectfully requested.

REJECTION UNDER 35 U.S.C. § 103

Claims 1-4 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Abolins (U.S. Pat. No. 4,692,490) in view of Takekoshi et al (US Patent No. 5,707,439 or 5,530,052). As mentioned above, Abolins neither teaches nor suggests the use of the specific organic clay as defined in amended Claim 1 of the present invention. Further, Abolins neither teaches nor suggests the use of the specific organic clay in a thin molded article having $L/t \geq 70$, which is defined in amended Claim 1 of the present invention from the view point of the rigidity of the thin injection molded article and the flow properties of the composite resin comprising the polymer and the organic clay.

Takekoshi et al discloses a composite material of an onium salt-treated clay and a polyphenylene ether resin, in which clay may be treated with mixed onium cations. However, Takekoshi et al neither teaches nor suggests the use of the specific organic clay in a composite resin composition comprising a polyphenylene oxide and a butadiene-styrene copolymer or in a thin injection molded article having L/t of not less than 70, in order to improve the rigidity of the thin injection molded article and the flow properties of the composite resin comprising the polymer and the organic clay. Further, Takekoshi et al neither teaches nor suggests that, by the treatment of clay with two or more organic agents or onium cations, the peeling of the organic clay and the PPO is facilitated so that the flow properties of the polymer and the organic clay are improved.

Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kosaka et al (U.S. Pat. No. 5,952,417) in view of Takekoshi et al (U.S. Pat. No. 5,707,439 or 5,530,052), and further in view of Abolins (U.S. Pat. No. 4,692,490) or Mizutani et al. (U.S. 2001/0014389 A1). The above discussion of Abolins and Takekoshi apply here also. Kosaka et al. merely discloses the use of clay as an inorganic filler for improving impact strength, but neither teaches nor suggests the use of the specific organic clay as defined in amended Claim 1 of the present invention in order to improve the rigidity of the thin injection molded article and the flow properties of the composite resin comprising the polymer and the organic clay or the use of such organic clay in a thin injection molded article having L/t of not less than 70.

Chao et al discloses the use of clay (HG 90: Hydragloss 90 from HUBER) as an inorganic filler. In Chao et al, clay is added to provide an interface between the inorganic filler and a polyphenylene ether-rubber continuous phase for a chromic acid etchant to attack, thereby leaving a rough substrate surface with pits and crevices for metal adhesion (see, column 5, lines 24-39). That is to say, the purpose of Chao et al is to improve the solder adhesion, which differs from the purpose of the present invention. Further, Chao et al neither teaches nor suggests the use of the specific organic clay as defined in amended Claim 1 of the present invention in order to improve the rigidity of the thin injection molded article and the flow properties of the composite resin comprising the polymer and the organic clay or the use of such organic clay in a thin injection molded article having L/t of not less than 70.

In Mizutani et al, a glitter material is added to a high flow rate resin material for the purpose of preventing flow mark formation during molding, and clay is exemplified as the glitter material. Further, Mizutani et al generally refers to PPO, but basically describes only polypropylene compositions in the examples. That is to say, Mizutani et al also neither teaches nor suggests the use of the specific organic clay as defined in the present invention in order to improve the rigidity of the thin injection molded article and the flow properties of the composite resin comprising the polymer and the organic clay or the use of such organic clay in a thin injection molded article having L/t of not less than 70.

Thus, Applicant believes Claim 1, as amended patentably distinguishes over the art of record. Likewise, Claims 2-4, which ultimately depend from Claim 1, are also believed to patentably distinguish over the art of record.


CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the

Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

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ATTACHMENT FOR CLAIM AMENDMENTS

The following is a marked up version of amended Claims 1, 3 and 4 in which underlines indicates insertions and brackets indicate deletions.

1. (Amended) A thin injection molded article composed of a composite resin material having organic clay dispersed in a polymer, wherein:

[wherein] said polymer comprises polyphenylene oxide and a butadiene-styrene copolymer, [and]

the relationship between the maximum flow length L of said composite resin material in said thin injection molded article and the average thickness t of the thin injection molded article satisfies the inequality: $L/t \geq 70[.]$; and

the organic clay is clay which has been rendered organic with an organic agent in which the clay is at least one member selected from the group consisting of montmorillonite, saponite, hectorite, beidellite, stevensite, nontronite, vermiculite, halloysite, mica, fluorinated mica, kaolinite and pyroferrite.

3. (Amended) A molded article according to Claim 1, wherein said organic clay is clay that has been rendered organic with two or more different [types of] organic agents.

4. (Amended) A molded article according to Claim 2, wherein said organic clay is clay that has been rendered organic with two or more different [types of] organic agents.